

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: BARRACLOUGH ET AL.
Docket: 11611.88US01
Title: VIDEO CONFERENCING ARRANGEMENT HAVING MULTI-PURPOSE DIGITAL CAMERA

CERTIFICATE UNDER 37 CFR 1.10

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By: 

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We are transmitting herewith the attached:

- ☒ Transmittal sheet, in duplicate, containing Certificate under 37 CFR 1.10.
- ☒ Utility Patent Application: Spec. 10 pgs; 14 claims; Abstract 1 pgs.; and Appendix, 4 pgs.
- ☒ 2 sheets of informal drawings
- ☒ Small entity status will be established at a later date
- ☒ An unsigned Combined Declaration and Power of Attorney
- ☒ Other: Information Disclosure Statement, Form 1449, and copies of the cited references.
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VIDEOCONFERENCING ARRANGEMENT HAVING
MULTI-PURPOSE DIGITAL STILL CAMERA

Related Application

5 The instant application is related to, and fully incorporates the teachings
of U.S. Patent Application No. _____ (Docket No. 11611.43-US-01), filed on
September 19, 1997, and entitled "Video TTY Device And Method For
Videoconferencing."

Field of the Invention

10 The present invention relates generally to communication systems and,
more particularly, to video communication systems and arrangements.

Background of the Invention

Video communication systems have become increasingly popular.
Videoconferencing, for example, is becoming more common in both business and
15 residential applications. Videoconferencing permits audio as well as visual live
communication between two remotely located terminals communicating over a single
channel. Videoconferencing has had limited success due to, for example, unavailability
of a common network interface, overly complex controls, poor video quality, limited
functionality, inconvenience, and high cost. Improving video quality and functionality

while simultaneously decreasing costs has proven to be a seemingly unobtainable goal. For this reason, there have been opposing pressures to develop certain more expensive systems having increased video quality and functionality and certain other systems that forego the convenience and quality criteria for the sake of reducing costs.

5 One recent approach, that attempts to addresses some of the above-mentioned issues, uses a digital video camera coupled to the input port of a PC which is programmed to provide videoconferencing over a communications channel, such as the Internet. This approach is useful for applications where a PC is readily available and the user is fully familiar with downloading the software and using the PC to control the
10 videoconferencing. However, the approach is disadvantageous for environments directed to those who are not as computer literate or not interested in using a computer for videoconferencing.

 The above types of implementations are, of course, a compromise. Ideally, videoconferencing systems and equipment can be provided for both business
15 and residential applications at reasonable costs and without sacrificing video quality, functionality, or convenience. The present invention is directed to accommodating this ideal.

Summary of the Invention

 The present invention is directed to methods and arrangements for use in
20 videoconferencing. According to one embodiment, the present invention is directed to a method of videoconferencing comprising the steps of: providing a videocommunicator

having a video signal input port, a video signal encoding circuit and a video signal output port; and using a digital still camera to generate video input signals to the video input port of the videocommunicator, the video output port of the videocommunicator capable of communicatively coupling to a communications channel for providing
5 videoconferencing.

According to another embodiment of the present invention, an arrangement for a videoconferencing system includes means for coding and decoding video images; and a digital still camera having an output port providing digital information representing a target area to the coding and decoding means.

10 Another aspect of the present invention is directed to a system having two videoconferencing terminals. Each terminal includes a set-top box having a video input port and a video output port, and first and second telephone ports. The set-top box is configured and arranged to provide video signals over the video output port and to output local video data signals over the second telephone port. The set-top box further
15 inputs remote video data signals using the second telephone port and is responsive to control signals provided at the first telephone port. A camera is coupled to the first video input port and is configured and arranged to output video signals representative of stored images of scenes captured by the camera. A telephone is coupled to the first telephone port and is used to receive control inputs and in response thereto, to provide
20 control signals to the set-top box. A monitor is coupled to the video output port to receive the video signals and display images represented by the video signals.

The above summary of the invention is not intended to describe each disclosed embodiment of the present invention. An overview of other example aspects and implementations will be recognizable from the figures and from the detailed description that follows.

5

Brief Description of the Drawings

Other aspects and advantages of the present invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

FIG. 1 is a block diagram of a videoconferencing system, according to a particular application of the present invention; and

FIG. 2 is a block diagram of a modular videoconferencing arrangement, illustrating an example implementation of one terminal shown in the system of FIG. 1, according to another particular application of the present invention.

While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is cover all modifications, equivalents and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

Detailed Description of the Preferred Embodiment

While the present invention may be useful in a variety of applications, the present invention has been found to be particularly advantageous in videoconferencing applications requiring or benefiting from real time and/or still frame visual communications. One aspect of the present invention is directed to modular, low-cost videoconferencing providing real time visual communication along with still frame, picture-like functionality. An appreciation of various aspects of the invention is best gained through a discussion of various application examples operating in such an environment.

Turning now to the drawings, FIG. 1 illustrates a data processing system for a videoconferencing application. The system includes data sending equipment depicted above a communication channel 12 of FIG. 1 and data receiving equipment depicted below the communication channel 12. While the sending and receiving of such data is often reciprocal in many data processing applications of this type as with the instant videoconferencing illustration, the configuration illustrated in FIG. 1 is simplified in this regard to facilitate the discussion.

At the sending end of the system of FIG. 1, a transmitting channel interface device 10 is used to send processed data over the communication channel 12 to a receiving channel interface device 14. The data that is presented to the channel interface device 10 is collected from various types of data sources including, for example, a digital still frame video camera 16, a microphone 18, a user control device 20, and a conventional personal computer 22. The data sources typically use buffers to

store the data to be collected. The data collected from each of these data sources is received by multiplexer/data processing equipment (MDPE) 24. The MDPE 24 collects and formats the data collected from each of the input sources for transmission over the channel 12. A monitor 40 is optionally used with the digital still frame video camera 16 to monitor the manner in which the video camera 16 captures the video images.

At the lower end of the system of FIG. 1, the formatted data communicated over the channel 12 is received by the channel interface device 14, which then presents the received data to demultiplexer/data processing equipment (DDPE) 30. The DDPE 30 is set up to sort out the formatted data received over the channel 12 according to instructions previously sent by the MDPE 24. The demultiplexed data is then presented to the appropriate output source equipment, including audio data to a speaker 32, video data to a monitor 34, and control data to external equipment for subsequent processing.

The MDPE 24 formats the collected data for transmission using any of a variety of modes of operation or capabilities. For example, audio data may be formatted using a capability that supports the ITU-T G.711, G.723, or G.728 standard.

For further information regarding use of a multiplexer to increase use of the transmission channel for video data, reference may be made to U.S. Patent Application No. 08/815,966, filed on March 13, 1997 (Atty. Docket No. 11611.15US01), filed concurrently herewith and incorporated herein by reference.

FIG. 2 illustrates a videocommunicator 60 including a digital signal processor for processing digital video data presented at a video input port 62 and for

presenting encoded video data to an output port 64. The encoding provided by the videocommunicator 60 includes video data compression and, as the application may require, video data decompression functionality. The arrangement further includes a digital still camera 66, a monitor 68, such as a conventional television set, and a conventional touch-tone telephone 70. The digital still camera 66, as exemplified in FIG. 2, is a commercially available digital still frame camera which is useful and applicable for digital photography. The digital video signal provided from the digital still frame camera 66 to the video input port 62 is used by the videocommunicator 60 to present an image or selected images to the local monitor 68, as well as over a communications channel 72 for processing or display remotely.

Touch-tone telephone 70, as shown in the example embodiment of FIG. 2, is a conventional telephone that is used in this arrangement for conventional telephony applications, as well as to provide an audio interface for videoconferencing using the arrangement of FIG. 2. In addition, the keypad of the telephone 70 is used to provide user control for the videocommunicator 60 including, for example, electronic pan/tilt/zoom function control, split-screen control and image size control to the remote and local displays. For further information concerning an example method for implementing pan/tilt/zoom function control, reference may be made to U.S. Patent Application Serial No. 08/861,619 (Docket No. 11611.47-US-01), entitled "Arrangement for Controlling the View Area of a Video Conferencing Device and Method Therefor" (incorporated herein by reference). Other control features and

functions may be implemented using conventional keypad control operations and will not be further discussed in detail.

Another important aspect of the present invention is directed to the split-screen display capability provided by the arrangement of FIG. 2. Certain commercially available digital still frame cameras, for example, the Sony DSC-1 or DSC-F1, provide a digital video signal that, in response to snapping a photograph using the camera 66, produces a split-screen representation having a live image representation as well as a still image shown as a subset image of the overall image provided from the camera 66 to the video input port 62. Using the videocommunicator 60, the data information received at the video input port 62 is encoded and presented to the local or remote display as a split-screen picture with no data processing provided by the videocommunicator 60 and directed to split-screen functionality per se. However, using the keypad controls of the telephone 70, the target images respectfully captured by the remote terminal and the videoconferencing terminal depicted by the arrangement of FIG. 2 can be manipulated for one or both of the displays, along with the still image presented from the digital still frame camera 66. Accordingly, as shown in FIG. 2, in response to a user directing the videocommunicator 60 via the keypad controls, the monitor 68 displays the stored snapshot along with the local target image, as provided by the digital still frame camera 66, as well as the remote video image as presented over the communication channel 72. This permits the viewer of the monitor 68 to view the image that the user at the remote terminal is viewing (the remote video), the target

image being provided by the local terminal (that includes the camera 66) and the subject item of discussion as displayed in still image form.

Specific applications for this above-described embodiment are seemingly without end. Using commercially available and relatively inexpensive components, such as the camera 66, a television set and a telephone, the videocommunicator can be used as a central controller providing videoconferencing signal coordination and processing in a relatively inexpensive, modular form.

It will be understood that the processor-based circuit, or videocommunicator shown above in FIG. 1 can be implemented using any of a variety of processor arrangements, including the arrangement of the referenced patent applications and that disclosed in U.S. Patent Application Nos. 08/692993 and 08/658917, respectively entitled and relating to issued patents also entitled "Programmable Architecture and Methods for Motion Estimation" (Patent No. 5,594,813) and "Video Compression and Decompression Processing and Processors" (Patent No. 5,379,351). These applications and issued patents are, incorporated herein by reference. As other example implementations, the videocommunicator of FIG. 1 is configured as a ViaTV product available from 8x8, Inc. (modified if needed to connect directly to an external digital still frame camera) and as a set-top box with the features of a VC55-type ViaTV Phone arrangement and with a keypad control console, such as a keypad, coupled into the MDPE 24 using conventional wiring or an infrared transmitter/receiver arrangement. The features of the VC55 are described in the attached appendix, which is incorporated herein by reference.

The various embodiments described above are provided by way of illustration only and are not intended to limit the invention. Those skilled in the art will readily recognize various modifications and changes that may be made to the present invention without strictly following the example embodiments and applications

5 illustrated and described herein. The scope of the present invention is set forth in the following claims.

WE CLAIM:

1. A method of videoconferencing comprising the steps of :
providing a videocommunicator having a video signal input port, a video signal encoding circuit and a video signal output port; and
using a digital still camera to generate video input signals to the video input port of the videocommunicator, the video output port of the videocommunicator capable of communicatively coupling to a communications channel for providing videoconferencing.
2. A method, according to claim 1, further including the step of using the videocommunicator to transmit audio and video signals over the communication channel.
3. A method, according to claim 1, further including using a digital still camera to provide video signals representing a live target area along with a split screen representing a stored stilled image.
4. A method, according to claim 3, further including using another output port of the videocommunicator to provide video images for a display.
5. A method, according to claim 4, further including using the other output port to output video data representing images received from the digital still camera

along with split screen representation of video images received over the communications channel.

6. An arrangement for use in a videoconferencing system, comprising:
means for encoding and decoding video images; and
a digital still camera having an output port providing digital information representing a target area to said encoding and decoding means.

7. An arrangement for use in a videoconferencing system, comprising:
a set-top box having a first video input port and a video output port, and first and second telephone ports, the set-top box configured and arranged to output video signals via the video output port, output local video data signals via the second telephone port, and input remote video data signals via the second telephone port, responsive to control signals at the first telephone port;

a camera coupled to the first video input port, and configured and arranged to output video signals representative of stored images of scenes captured by the camera;

a telephone coupled to the first telephone port and configured and arranged to receive user control inputs and, responsive thereto, provide control signals to the set-top box; and

a monitor coupled to the video output port to receive the video signals and display images represented by the video signals.

8. The arrangement of claim 7, further comprising:
the set-top box having a second video input port;
a video camera coupled to the second video input port;
the monitor having a screen viewing area and the set-top box being responsive to control signals to split the screen to simultaneously display a stored image and images represented by the local video data signals.
9. The arrangement of claim 7, further comprising:
the set-top box having a second video input port;
a video camera coupled to the second video input port;
the monitor having a screen viewing area and the set-top box being responsive to control signals to split the screen to simultaneously display a stored image and images represented by the remote video data signals.
10. The arrangement of claim 7, further comprising:
the set-top box having a second video input port;
a video camera coupled to the second video input port;
the monitor having a screen viewing area and the set-top box being responsive to control signals to split the screen to simultaneously display a stored image and images represented by the local video data signals and the remote video data signals.
11. The arrangement of claim 7, further comprising:

the set-top box having a second video input port;
a video camera coupled to the second video input port;
the monitor having a screen viewing area and the set-top box being responsive to control signals to split the screen to simultaneously display a plurality of stored images and images represented by the local video data signals and the remote video data signals.

12. A video image viewing arrangement, comprising:

a set-top box having first and second input ports, an output port, and an internal video camera, the set-top box, configured and arranged to output display signals via the output port responsive to control signals at the second input port;

an external video camera coupled to the first input port of the set-top box, configured and arranged to output video signals;

a control unit coupled to the second input port and configured and arranged to receive user control inputs and, responsive thereto, provide control signals to the set-top box; and

a display coupled to the output port of the set-top box to receive the display signals.

13. A video image viewing arrangement of claim 12, wherein the display has a screen viewing area and the set-top box is responsive to control signals to split the screen to simultaneously display video information from the internal video camera and video information from the external video camera.

screen to simultaneously display video information from the internal video camera and video information from the external video camera.

14. A method of videoconferencing comprising the steps of :

providing a videocommunicator having a video signal input port, a video signal encoding circuit and a video signal output port;

using a digital still camera to generate video input signals to the video input port of the videocommunicator, the video output port of the videocommunicator capable of communicatively coupling to a communications channel for providing videoconferencing; and

using the videocommunicator for controllably altering a display, including at least one of pan, tilt and zoom functions, of the video input signals without controlling the digital still camera.

Abstract

A videoconferencing system uses a modular terminal that includes a conventional digital still camera coupled to the input port of the videocommunicator, such as a set top box. There are various features provided by this arrangement, including using the digital still camera to present video information to the videocommunicator with a split screen image representing the still image, a receiver arrangement permitting the digital still camera to fit securely and adjacent to the videocommunicator, and pan/tilt/zoom camera features provided electronically.

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Date of Deposit: October 1, 1997

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By: 

Name: William Smith

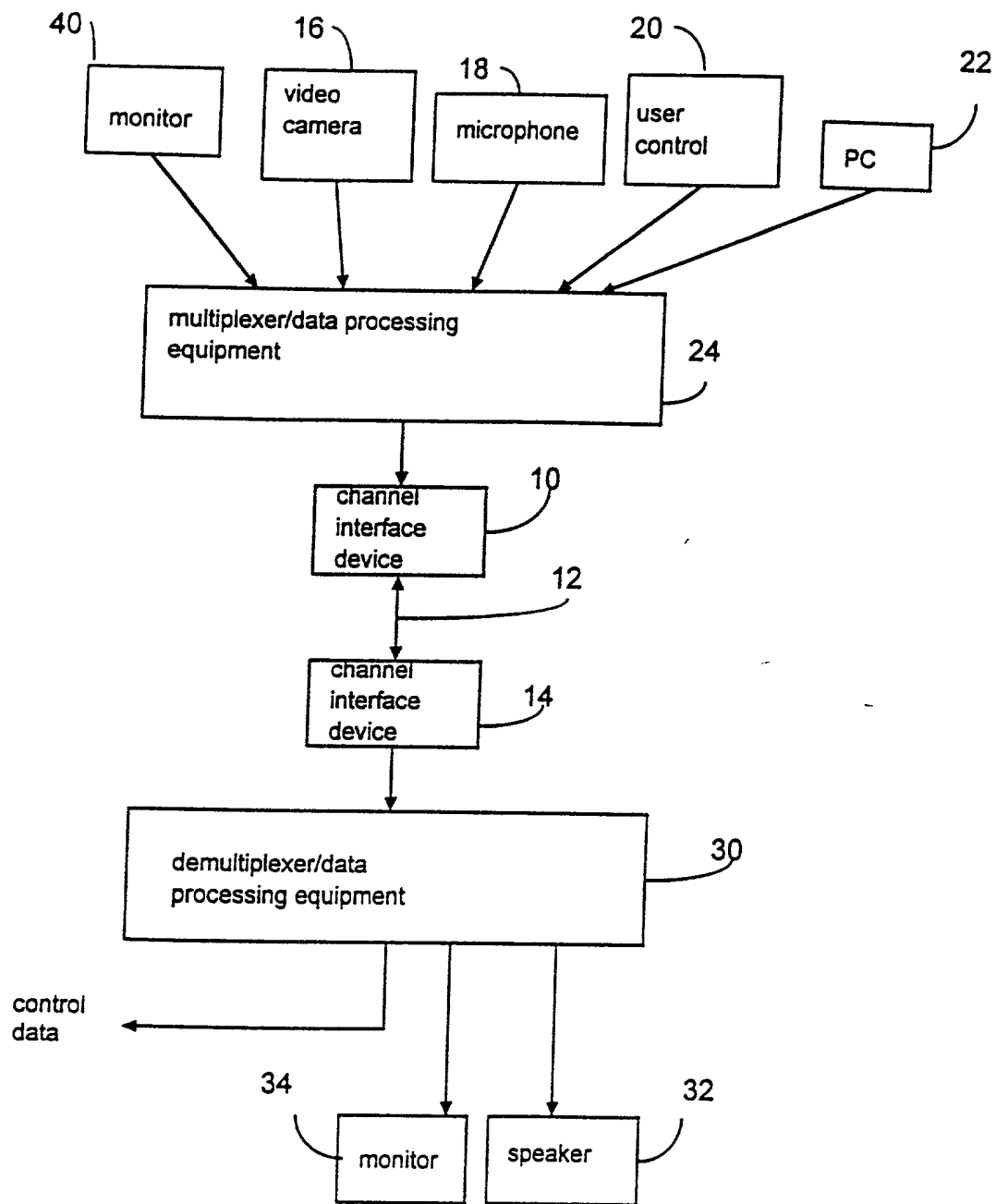
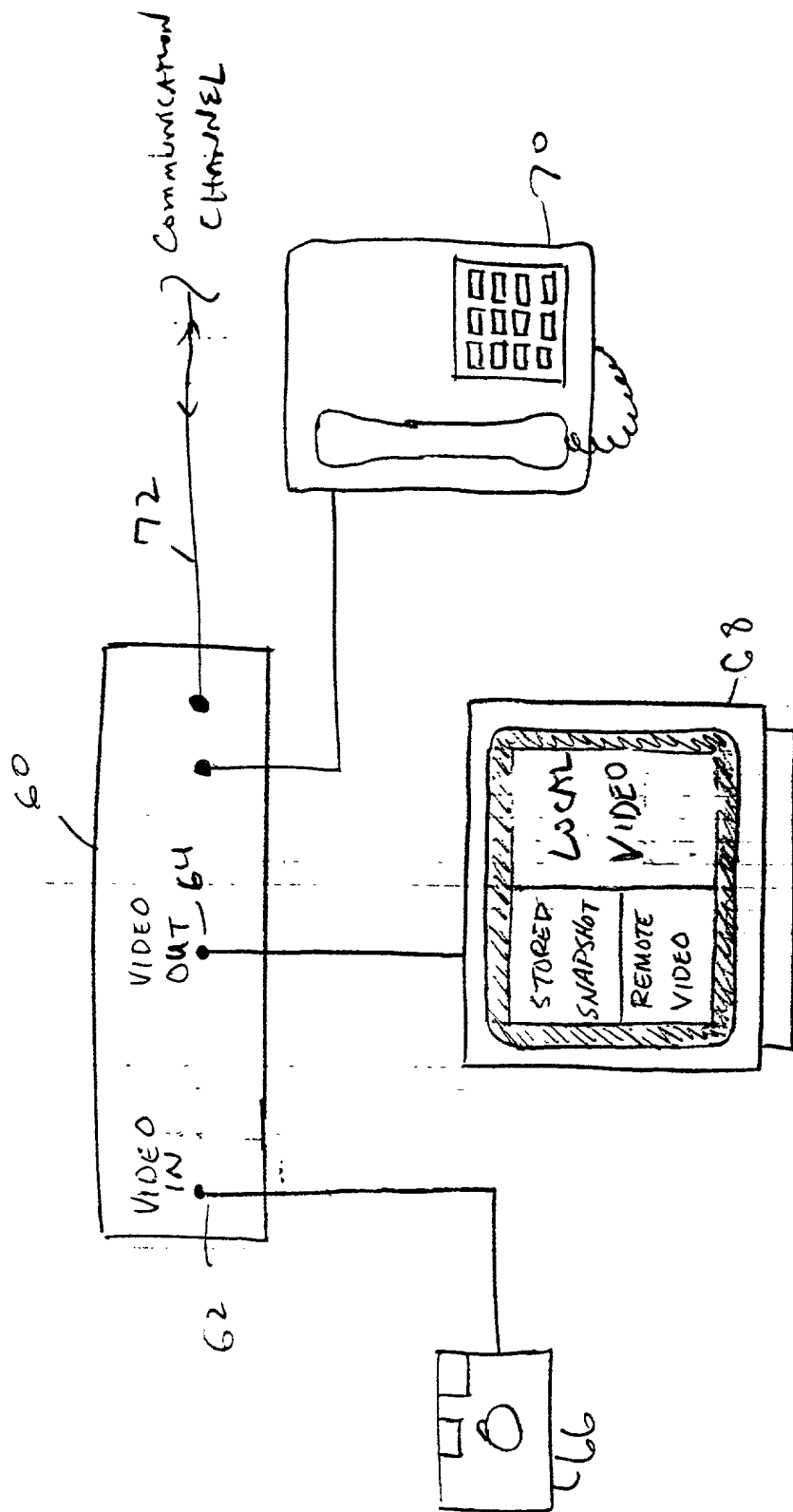


FIG. 1

Fig. 2



MERCHANT, GOULD, SMITH, EDELL, WELTER & SCHMIDT

United States Patent Application

DECLARATION UNDER 37 C.F.R. § 1.63

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

The specification of which

- a. ☐ is attached hereto
- b. ☒ is entitled **VIDEO CONFERENCING ARRANGEMENT HAVING MULTI-PURPOSE DIGITAL STILL CAMERA**, having an attorney docket number 11611.88US01.
- c. ☐ was filed on _____ as application serial no. _____ and was amended on _____ (if applicable) (in the case of a PCT-filed application) described and claimed in international no. _____ filed _____ and as amended on _____ (if any), which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (attached hereto).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

- a. ☒ no such applications have been filed.
- b. ☐ such applications have been filed as follows:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)
ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	DATE OF FILING (Day, Month, Year)

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant, Gould, Smith, Edell, Welter & Schmidt to the contrary.

Please direct all correspondence in this case to Merchant, Gould, Smith, Edell, Welter & Schmidt at the address indicated below:

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Minneapolis, MN 55402-4131

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2	Full Name Of Inventor	Family Name Barracough	First Given Name Keith	Second Given Name
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Signature of Inventor 203:			Date:	

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information

known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim;

or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.